

Amendments to the Claims

The current listing of the claims replaces all previous amendments and listings of the claims.

1. (Canceled)

2. (Currently Amended) A sheet feeding apparatus comprising:

a feed roller;

a cantilever shaft;

~~at least one driven gear~~ a plurality of driven gears disposed on the cantilever shaft, ~~the~~
at least one driven gear having first and second pairs of adjacent teeth of a same set of teeth,
the first pair of adjacent teeth separated by a first gap and the second pair of adjacent teeth
separated by a second gap less than the first gap;

~~at least one driving gear~~ a plurality of driving gears configured to drive the plurality
of driven gears, at least one driving gear comprising a set of teeth adapted to engage the first
and second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller supported
on an end of the cantilever shaft and adapted to be rotated in a sheet feeding direction and a
reverse direction and to separate and convey sheet media held between said feed roller and
said reverse roller.

3. (Canceled)

4. (Previously Presented) A sheet feeding apparatus which feeds sheet media,
comprising:

a feed roller;

a reverse roller, which is pressed into contact with said feed roller, is provided by
being elastically supported upward by a free end of a cantilever shaft adapted to integrally
rotate with a driven gear engaging a driving gear and through a torque limiter, the reverse

roller adapted to be rotated in a sheet feeding direction and a reverse direction, and to separate and convey said sheet media held between said feed roller and said reverse roller one by one by utilizing differences in friction coefficients among said feed roller, said reverse roller, and said sheet media; and

a length variable unit having a variable length, based on such conditions that a position of an engagement part and a rotational direction of said driving gear are determined so that teeth surfaces of said driven gear undergo an upward force of a pressurizing force by said driving gear based on said engagement part as an action point of force, and the pressurizing force of said reverse roller against said feed roller is periodically changed by varying said length from a fulcrum, which is a cantilever supporting part of said cantilever shaft, to an action point of the force,

wherein said length variable unit is integrally formed with said driving gear or said driven gear,

said length variable unit comprises a group of driving gears formed with a plurality of gears arranged at intervals on a driving gear supporting shaft that supports said driving gear, and a group of driven gears formed with a plurality of gears arranged at intervals on a driven gear supporting shaft that supports said driven gear, and

each gear forming either one of these groups of driving gears and driven gears is a teeth-omitted gear that has a teeth-omitted portion, where teeth are omitted on a circumference, and teeth-omitted gears are arranged so that teeth-omitted portions are complemented by each other.

5. (Previously Presented) The sheet feeding apparatus according to claim 4, wherein one gear has a plurality of said teeth-omitted portion.

6. (Original) The sheet feeding apparatus according to claim 4, wherein a tooth Y next to a teeth-omitted portion in one of said teeth-omitted gears and a tooth Z at a position of

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the nearest phase to said tooth Y of teeth next to teeth-omitted portions in another teeth-omitted gear are simultaneously engaged with respective opposite gears.

7. (Original) The sheet feeding apparatus according to claim 4, wherein a plurality of teeth-omitted gears forming said group of gears are integrally formed.

8.-17. (Canceled)

18. (Currently Amended) An image formation apparatus comprising:
a sheet feeding apparatus adapted to feed sheet media; and
an image forming unit adapted to form an image on the sheet media fed by said sheet feeding apparatus,

wherein said sheet feeding apparatus comprises:

a feed roller;

a cantilever shaft;

~~at least one driven gear~~ a plurality of driven gears disposed on the cantilever shaft, ~~the~~ at least one driven gear having first and second pairs of adjacent teeth of a same set of teeth, the first pair of adjacent teeth separated by a first gap and a the second pair of adjacent teeth separated by a second gap less than the first gap;

~~at least one driving gear~~ a plurality of driving gears configured to drive the plurality of driven gears, at least one driving gear comprising a set of teeth adapted to engage ~~and~~ the first and second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller supported on an end of the cantilever shaft and adapted to be rotated in a sheet feeding direction and a reverse direction and to separate and convey sheet media held between said feed roller and said reverse roller.

19. and 20. (Canceled)

21. (Currently Amended) A sheet feeding method comprising the steps of:

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feeding sheet media between a feed roller and a reverse roller pressed into contact with said feed roller, the reverse roller adapted to be rotated by a ~~driven gear~~ plurality of driven gears driven by a plurality of driving gears and to separate and convey said sheet media held between said feed roller and said reverse roller; and

engaging first and second pairs of adjacent teeth of a same set of teeth of ~~the~~ at least one driven gear with a set of teeth of ~~the~~ at least one driving gear, the first pair of adjacent teeth separated by a first gap and the second pair of adjacent teeth separated by a second gap less than the first gap.

22. (Currently Amended) ~~The~~ A sheet feeding apparatus ~~according to claim 2,~~
comprising:

a feed roller;

a cantilever shaft;

at least one driven gear disposed on the cantilever shaft, the at least one driven gear having first and second pairs of adjacent teeth of a same set of teeth, the first pair of adjacent teeth separated by a first gap and the second pair of adjacent teeth separated by a second gap less than the first gap;

at least one driving gear comprising a set of teeth adapted to engage the first and second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller supported on an end of the cantilever shaft and adapted to be rotated in a sheet feeding direction and a reverse direction and to separate and convey sheet media held between said feed roller and said reverse roller,

wherein the at least one driven gear comprises first and second driven gears, and the at least one driving gear comprises first and second driving gears.

23. (Currently Amended) ~~The A~~ sheet feeding apparatus ~~according to claim 2,~~
comprising:

a feed roller;

a cantilever shaft;

at least one driven gear disposed on the cantilever shaft, the at least one driven gear
having first and second pairs of adjacent teeth of a same set of teeth, the first pair of adjacent
teeth separated by a first gap and the second pair of adjacent teeth separated by a second gap
less than the first gap;

at least one driving gear comprising a set of teeth adapted to engage the first and
second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller supported
on an end of the cantilever shaft and adapted to be rotated in a sheet feeding direction and a
reverse direction and to separate and convey sheet media held between said feed roller and
said reverse roller,

wherein the at least one driven gear comprises first and second driven gears, and the
at least one driving gear comprises first and second driving gears, the first and second driving
gears adapted to engage and drive the respective first and second driven gears.

24. (Previously Presented) The sheet feeding apparatus according to claim 23,
wherein the first driven gear has a first predetermined number of teeth, and the second driven
gear has a second predetermined number of teeth, and at least one of the first and second
predetermined number of teeth is less than a predetermined number of teeth of at least one of
the first and second driving gears.

25. (Previously Presented) The sheet feeding apparatus according to claim 23,
wherein the first driven gear has a first predetermined number of teeth, and the second driven
gear has a second predetermined number of teeth, and each of the first and second

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predetermined number of teeth is less than a predetermined number of teeth of each of the first and second driving gears.

26. (Currently Amended) ~~The A~~ image formation apparatus ~~according to claim 18,~~
comprising:

a sheet feeding apparatus adapted to feed sheet media; and
an image forming unit adapted to form an image on the sheet media fed by said sheet
feeding apparatus,

wherein said sheet feeding apparatus comprises:

a feed roller;

a cantilever shaft;

at least one driven gear disposed on the cantilever shaft, the at least one driven
gear having first and second pairs of adjacent teeth of a same set of teeth, the first pair of
adjacent teeth separated by a first gap and a the second pair of adjacent teeth separated by a
second gap less than the first gap;

at least one driving gear comprising a set of teeth adapted to engage the first
and second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller
supported on an end of the cantilever shaft and adapted to be rotated in a sheet feeding
direction and a reverse direction and to separate and convey sheet media held between said
feed roller and said reverse roller,

wherein the at least one driven gear comprises first and second driven gears,
and the at least one driving gear comprises first and second driving gears.

27. (Currently Amended) ~~The An~~ image formation apparatus ~~according to claim 18,~~
comprising:

a sheet feeding apparatus adapted to feed sheet media; and

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an image forming unit adapted to form an image on the sheet media fed by said sheet feeding apparatus,

wherein said sheet feeding apparatus comprises:

a feed roller;

a cantilever shaft;

at least one driven gear disposed on the cantilever shaft, the at least one driven gear having first and second pairs of adjacent teeth of a same set of teeth, the first pair of adjacent teeth separated by a first gap and a the second pair of adjacent teeth separated by a second gap less than the first gap;

at least one driving gear comprising a set of teeth adapted to engage the first and second pairs of adjacent teeth to drive the at least one driven gear; and

a reverse roller pressed into contact with the feed roller, the reverse roller supported on an end of the cantilever shaft and adapted to be rotated in a sheet feeding direction and a reverse direction and to separate and convey sheet media held between said feed roller and said reverse roller,

wherein the at least one driven gear comprises first and second driven gears, and the at least one driving gear comprises first and second driving gears, the first and second driving gears adapted to engage and drive the respective first and second driven gears.

28. (Previously Presented) The image formation apparatus according to claim 27, wherein the first driven gear has a first predetermined number of teeth, and the second driven gear has a second predetermined number of teeth, and at least one of the first and second predetermined number of teeth is less than a predetermined number of teeth of at least one of the first and second driving gears.

29. (Previously Presented) The image formation apparatus according to claim 27, wherein the first driven gear has a first predetermined number of teeth, and the second driven gear has a second predetermined number of teeth, and each the first and second predetermined number of teeth is less than a predetermined number of teeth of each of the first and second driving gears.

30. (New) The sheet feeding apparatus according to claim 2, wherein the plurality of driven gears comprises first and second driven gears each including a teeth-omitted gear that has a teeth-omitted portion, where teeth are omitted on a circumference, and teeth-omitted gears are arranged so that teeth-omitted portions are complemented by each other.

31. (New) The image formation apparatus according to claim 18, wherein the plurality of driven gears comprises first and second driven gears each including a teeth-omitted gear that has a teeth-omitted portion, where teeth are omitted on a circumference, and teeth-omitted gears are arranged so that teeth-omitted portions are complemented by each other.

32. (New) The sheet feeding method according to claim 21, wherein the plurality of driven gears comprises first and second driven gears each including a teeth-omitted gear that has a teeth-omitted portion, where teeth are omitted on a circumference, and teeth-omitted gears are arranged so that teeth-omitted portions are complemented by each other.